2.1.5 Winter wheat variety trial - Bairnsdale, Vic

Location:
Inverleigh Research Site.

Funding:
This was an SFS Geelong Branch funded trial.

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Thanks to the Bairnsdale Branch Committee.

Background/Aim:
New winter wheat varieties need to be tested across a number of years before they will be considered in the domestic or export markets. This trial evaluates a number of varieties that are either commercially available or close to commercial release that may be suitable for the growing conditions of the south east of Victoria.

Take home messages:

- The average yield for the Winter wheat variety trial was 3.03 t/ha. The highest yielding variety was Amarok with 3.81 t/ha.
- The shorter season varieties yielded well compared to the longer season varieties. This was a response to the rapid finish to the season, where the longer season varieties lost some yield potential during grain fill.
- The rapid finish to the season also reduced the grain quality, where test weight and screenings were the main reasons for downgrading.

Trial information:
Trial design consisted of a replicated randomised block design using 4 repetitions. Plot lengths were 18 metres long and 1.45m wide. Rainfall was highly variable throughout the season, with below average growing season rainfall. Late rainfall in November was not considered a contributor to yield results for this trial.

Rainfall:

Avg. Annual:	653.5mm, Bairnsdale 1942-2009
Avg. G.S.R.	479.8mm, Bairnsdale 1942-2009
2009 Total:	390.5mm, Bairnsdale Research Site
2009 G.S.R.	April – October = 259.2mm[1]
	(Bairnsdale Research Site; 131.3mm below average)

[1] Yield Potential: 1/3 of Jan (9mm) & Feb (44.2mm) with monthly totals above 20mm + ½ March (12.6mm) rainfall when total above 20mm + ((April – October rainfall) – 114mm*) x 20kg/mm/ha. In total December-March adjusted rainfall to stored soil water = 14.7mm, plus April-October = 259.2mm, minus evaporation factor of 114mm* => 159.9. Therefore, for Bairnsdale, the Wheat Variety Trial water limited yield should be 3.20t/ha, or 159.9mm x 20kg/mm/ha.
*Kirkagaard 2009, Evaporation intercept adjustment for a clay loam.

Paddock History:
2008: Wheat & canola, 2007: Field peas, green manure crop

Soil Type: Sandy clay loam

Treatment list:
16 current wheat varieties. Measurements included yield and grain quality components, including protein, test weight, screenings and resulting classification.

Sowing rate:
Seeding rate based on seed size with a desire to establish 160 plants/m^2.

Sowing date: 12th May 2009

Harvest Date: 24th December 2009

Fertiliser:
100kg/ha MAP at sowing, Urea at 100kg/ha at stem elongation (28th August)

Herbicides:

- 12/5/09 Round Up P/max @ 1.5L/ha + Triflur 480 @ 1.5L/ha
- 2/9/09 Hoegrass @ 1.0L/ha + Lontrel @ 0.15L/ha + Wetter @ 0.25L/ha

Results and discussion:
The average yield for the Winter wheat variety trial was 3.03 t/ha for the 2009 season. Amarok was the highest yielding with 3.81 t/ha followed by Beaufort and Frelon which both yielded 3.54 t/ha. Beaufort also yielded within the top two in the Spring wheat trial with 2.38 t/ha, highlighting that time of sowing is an important agronomic decision that must be made. This earlier time of sowing will have contributed to the improved water use efficiency of the trial compared to the Spring wheats.

The shorter season varieties yielded better than the longer season varieties, where the rapid finish to the season reduced the yield potential of the longer season varieties. Naparoo had the lowest grain yield, however this variety is known to have poor shatter resistance and this may contribute to the poor yield result.

Table 1: Grain yield, corrected to 12.5% moisture, sprayed with fungicide and compared to unsprayed check. A WUE calculation and comparison to the 2008 yield performance is also included.

Variety	[1]Yield (t/ha)	[2]Sig. Diff.	[3]WUE % of 3.20t/ha	2008 Ranking	Quality Classification Potential
Amarok	3.81	a	119		Feed
Beaufort	3.54	a	111		Feed
Frelon	3.54	a	111		Feed
Revenue	3.43	a	107		Feed
Preston	3.34	ab	104		APW
10.10.3	3.09	abc	96		Feed
Einstein	2.45	bcd	77		Feed
Mackellar	2.14	cd	67		Feed
Naparoo	1.91	d	60		Feed
Mean	**3.03**				
LSD (P=0.05)	**0.981**				
CV	**22.21**				
Trt Prob (F)	**0.003**				

[1] Consideration needs to be taken for yields, as plots represent 72.5% of arable area and thus should be calculated using this percentage for comparison to local and commercial results.
[2] Means followed by the same letter do not significantly differ (P=0.05, LSD).
[3] Water Use Efficiency percentages are calculated based on the water limited potential yield of wheat at Bairnsdale for the 2009 growing season; being 159.9mm x 20kg/mm/ha, or 3.20t/ha.

Grain quality was reduced for the 2009 season; this was due to the rapid finish to the season where unseasonal hot conditions in early November during grain fill significantly reduced the yield and quality potential. Test weight and screenings were the main parameters for downgrading, where only Amarok recorded a test weight above 70 kg/hl, and Preston with the lowest screenings at 6.5%.

Table 2: Grain quality analysis, including protein, test weight & screenings that contributes to final economic analysis of variety performance on a GM/Ha basis (using standard inputs across all treatments of $450/ha).

Variety	Yield (t/ha)	Protein %[1] (min)	Test Weight kg/hl[1]	Screenings below 2.0mm[1]	Resultant Quality Classification
APW1 Specs		**10.5**	**74.0**	**5.0**	
Amarok	3.81	11.2	70.6	9.5	Feed
Beaufort	3.54	11.3	68.2	11.3	Feed
Frelon	3.54	11.7	69.9	12.5	Feed
Revenue	3.43	10.3	66.9	14.0	Feed
Preston	3.34	12.4	69.9	6.5	AGP1
10.10.3	3.09	11.6	66.6	10.3	Feed
Einstein	2.45	11.3	61.4	12.8	Feed
Mackellar	2.14	10.9	66.3	13.5	Feed
Naparoo	1.91	11.9	68.4	11.3	Feed
Mean	**3.03**	**11.39**	**67.6**	**11.28**	
LSD (P=0.05)	**0.981**	**0.806**	**2.183**	**1.830**	
CV	**22.21**	**4.85**	**2.21**	**11.12**	
Trt Pr (F)	**0.003**	**0.001**	**0.001**	**0.001**	

[1]Quality parameterisation is based on 2009-2010 NACMA Wheat Standards and should be used as a guide only. Cells with gray covers indicate readings outside preferred test range for highest achievable grade – testing undertaken at Riordan Grains, Inverleigh Office.

Summary:
The average yield for the Winter wheat variety trial was 3.03 t/ha for 2009. Amarok was the highest yielding with 3.81 t/ha followed by Beaufort and Frelon which both yielded 3.54 t/ha. The shorter season varieties yielded better than the longer season varieties, where the rapid finish to the season reduced the yield potential of the longer season varieties. The rapid finish to the season also reduced the grain quality, where test weights and screenings were the main reasons for downgrading.